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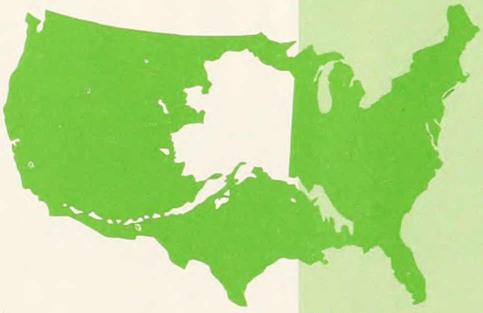
OUR PUBLIC LANDS . . .



500 million acres of land that belong to us and to our neighbors and to all the people of the United States . . . public lands that are rich in natural resources . . . timber, rangeland, water, minerals, and land for every use . . . "active acres" that must be carefully and wisely managed for the welfare of the Nation . . .

As a forum for the exchange of ideas and information on the development, utilization, and conservation of the resources on public lands, this periodical contains no copyrighted material. If pictures or material are reprinted, a credit line should be given Our Public Lands *and the Bureau of Land Management.*

Carlos Whiting, *Editor.*

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Oscar L. Chapman, Secretary

BUREAU OF LAND MANAGEMENT
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THE SECRETARY STATES OUR PURPOSE

Better coordination of the policies and objectives of community, Sta and Federal administrators of the Nation's resources is a generally recognized need. Our natural wealth, a major element of United States strength, must be carefully managed, utilized, and conserved. This is the consensus of today's thinking.

The Bureau of Land Management, one of our principal conservation agencies, has wisely chosen to publish Our Public Lands as a medium of information-exchange between the managers of public lands and the citizens who use those lands. This is in keeping with the democratic tradition of fully informing the public, and of promoting cooperation between the public and its civil servants.

The public domain under the administration of the Bureau has always been of tremendous importance to the Nation, and has always had a profound effect on our economy and on our social patterns. This importance will not decline in the years to come. Alaskan lands, especially, will be of increasing significance. So will the timber, grazing, and mineral lands of the West. These lands must be wisely used in this period of national emergency to increase the Nation's productivity and to provide an additional margin of security to our people.

If our land is to be used intelligently, those who use and manage it must not only understand and accept their great responsibility; there must also be a means for acquainting them with the ideas, techniques, and procedures found useful by their fellows. To accomplish this is the purpose of Our Public Lands.

Oscar L Chapman

Secretary of the Interior.

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PUBLIC LANDS TODAY

by **MARION CLAWSON**, *Director,* Bureau of Land Management

The public lands of the United States have always been, throughout the history of our Nation, and are today, important in the lives of our citizens and for our economy. Moreover, the experience we have gained with them is today important to the rest of the free world.

To a large extent, the history of the public lands of the United States is the history of the United States itself. By the Louisiana Purchase, the Oregon Compromise, the cession from Mexico, and in other ways our Nation expanded from a relatively narrow strip along the Atlantic Ocean to cover the entire central part of the North American Continent. The land thus acquired became public land. Out of it have been created 29 of our present 48 States.

Two-thirds of the present privately owned land the United States was once public land. The way in which this land was disposed of has determined the kind of rural society which we have in this country. Today title to land in the United States is secure. People know what they own and they can defend their title against others who might claim it. For the most part, land is cultivated in the United States by those who own it.

In these and in other ways the land system of the United States is superior to that of most of the rest of the world.

The public lands of the United States are today in active demand. Over 20,000 ranchers run nearly 10 million head of livestock within the organized grazing districts and over 10,000 other ranchers lease small tracts of public rangeland. Over 20,000 oil and gas leases are in effect today and from the public domain are taken annually large quantities of petroleum products on which the Government collects a royalty of over $30,000,000. Relatively large amounts of timber and other wood products are sold from the public lands. A vast variety of other uses results in further heavy demand for the lands.

The public lands of the United States are vital to the Nation's economy and particularly to the West. They can and are being used for a wide variety of purposes. Multiple use of land is not only possible but often desirable. The public lands need substantial investment of capital for their rehabilitation and improvement in order that they may make the greatest contribution to the welfare of the Nation.

Many countries in the world can learn a great deal about land management from the United States. Much of their land is not well managed for its permanent productivity or for its maximum income. We have an opportunity and a responsibility to make our experience helpful to these other countries.

NEEDS AND OPPORTUNITIES . . .

CONSERVATION OF THE PUBLIC RANGE

by **KARL S. LANDSTROM**, *Regional Chief,* Division of Land Planning, Region I

CONDITIONS AND PROBLEMS

By and large, the public range, though constituting a major part of the Western livestock base, is low in productivity in relation to past and potential conditions. The Pacific bunchgrass type in Idaho, Oregon, and California has withstood unregulated grazing poorly. Annual grasses have infiltrated, greatly reducing grazing capacity and increasing fire hazards. Sagebrush grasslands in Oregon and Idaho now have only a third of the productivity that they should and might have. Weeds have turned the range into a reservoir for virus plant infections and a breeding ground for damaging insects.

The public range has suffered over the years from over-use, drought, fire, and other causes. The cumulative depletion in terms of soil erosion, siltation, excessive water runoff and other damage is severe.

Depletion, serious in its own right, has been intensified in economic effect by strong and expanding demands for range livestock and by reductions in availability of range for grazing . . . owing to exclusions for watershed protection and other uses. Irrigation development of rangeland areas has reduced the area available for range, altered the range economy, and increased the demand for range livestock to be fattened on irrigated pastures.

REHABILITATION OPPORTUNITIES

Experience has shown that adapted treatment stops or retards soil and water losses and increases grazing capacity promptly.

The Bureau of Land Management, Forest Service, Soil Conservation Service, and State colle have conducted experiments and demonstratio of range rehabilitation over a period of years. Illustrative of results are 5,000 acres near Fort Rock, Oreg., which were seeded to crested wheatgrass from 1930 to 1943. Crested wheat keeps

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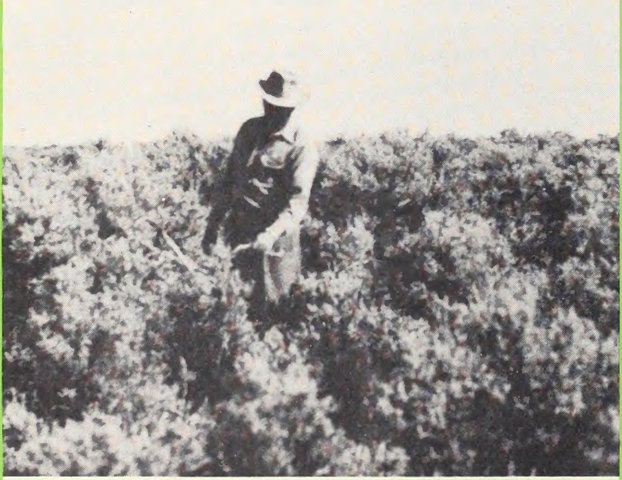
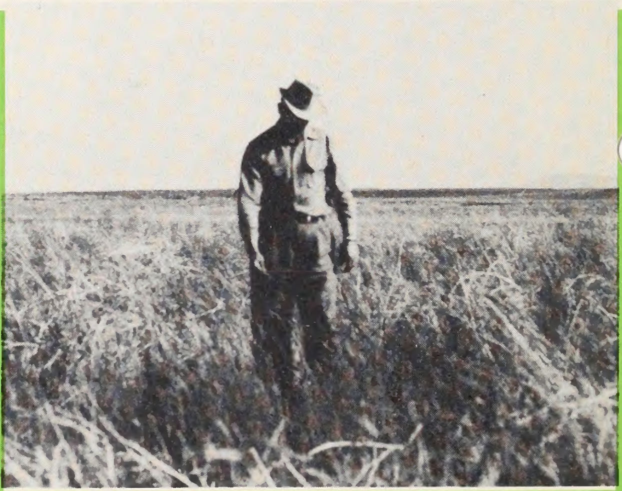
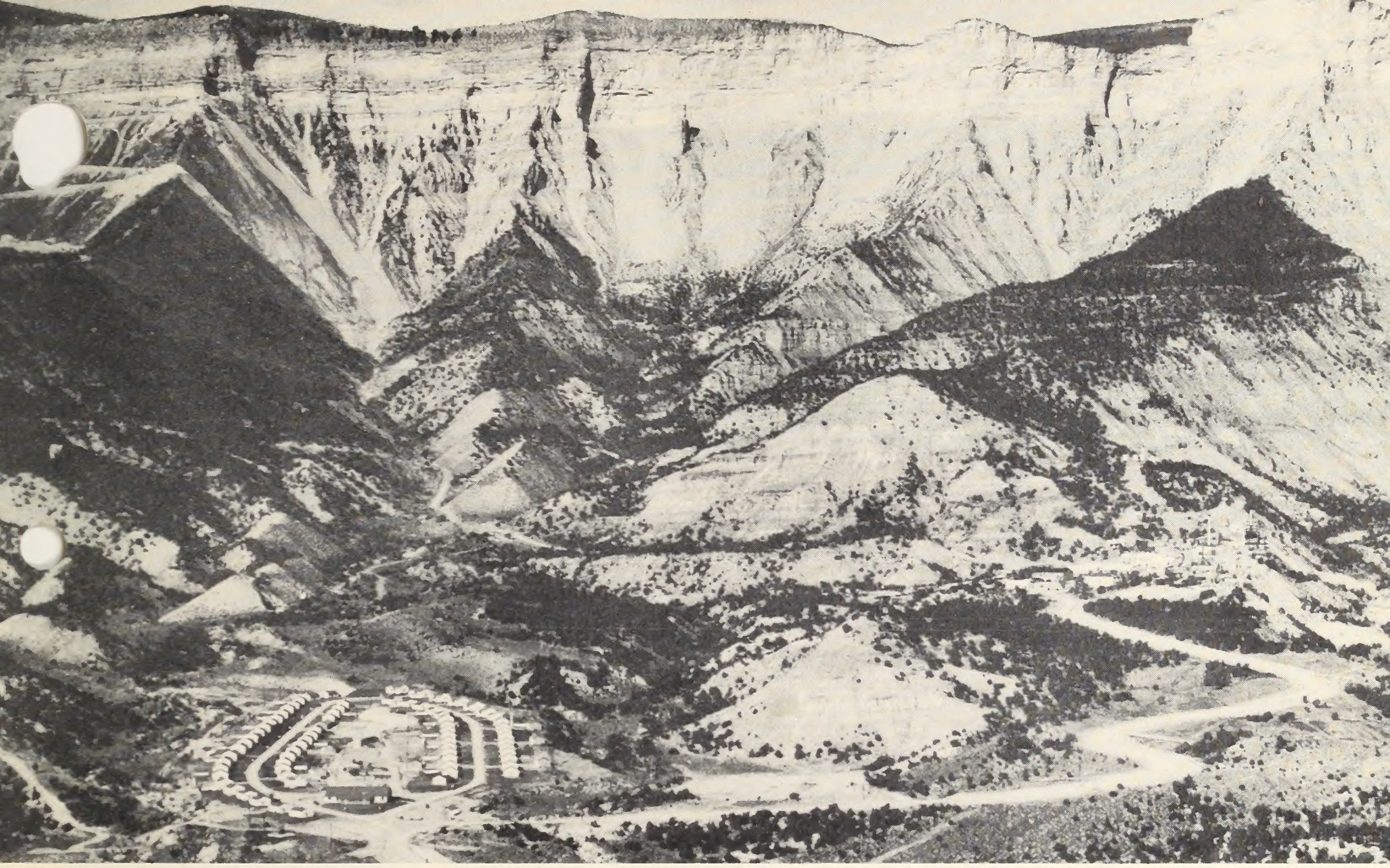


BEFORE RESEEDING. This is typical big-sagebrush type on Federal range,. In this condition, the land is practically worthless from a grazing standpoint, but it can be rehabilitated.



AFTER RESEEDING. Crested wheatgrass and sweet clove were drilled into this burn. At the end of the second growin season, the range supported grazing at 3 acres per cow-mo



LORADO'S MOUNTAIN OF OIL. Cliffs of oil shale provide one of America's greatest untapped resources of oil. Bureau Mines Oil-Shale Demonstration Plant near Rifle, Colo. Bureau of Mines photo.

LAND OFFICE BOOM IN OIL-SHALE PATENTS

by H. J. VANDER VEER, *Regional Chief,* Division of Adjudication, Region IV

Feverish research on methods of developing the oil-rich shales of western Colorado, eastern Utah, and southern Wyoming has created a boom in the processing of land patents. Efforts to utilize the energy locked up in these mountains of oil may make it possible to prevent war—or to win a war—and the resultant scurry to file patent claims on this important resource of the public domain is understandably great.

The United States Bureau of Mines has proved feasible the development of 100 billion barrels of oil from the "mahogany ledge" of the Green River formation of oil shale in Colorado—twice as much oil as has ever been produced in this untry from underground petroleum, and several es the Nation's proved reserves. Another 200 billion barrels of oil lie in the less-productive shales of the same formation. In addition, vast reserves of largely unexplored oil shale exist in other States. What this means to a nation whose life blood is oil needs no re-emphasis.

The strategic petroleum-like resource in oil shale is a complex organic compound called kerogen, which is composed chiefly of partially putrefacted remains of primitive macroscopic aquatic plants and animals which flourished in the lakes of the middle Eocene times.

American ingenuity and perseverance have developed new methods of mining, retorting, and refining. From kerogen the Bureau of Mines has, through a retort method, developed and

(Continued on page 12)

HALOGETON

RECOGNIZE IT! FIGHT IT!

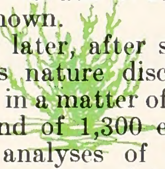
by KENNETH B. PLATT,
Range Conservationist, **Region I**

HALOGETON. **These forage-hungry sheep, nibbling on poisonous halogeton, may die! Photo by Carl Iwasaki for LIFE.**

Halogeton! Halogeton! Calling all hands! Stamp it out! Keep it from spreading!

If that cry, now rising throughout the West, carries some of the urgency of a 4-alarm fire-call the likeness is well merited. For halogeton is spreading like fire across the western rangeland.

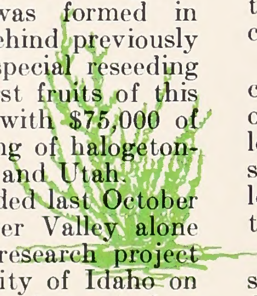
Poisonous cousin of Russian thistle, halogeton is an invader plant on our dry rangelands. First spotted in northern Nevada in 1935, its poisonous qualities were unknown.



Not till 10 years later, after spreading widely, was its treacherous nature discovered. In one catastrophic stroke, in a matter of hours, halogeton killed an entire band of 1,300 ewes near Malta, Idaho. Chemical analyses of halogeton-loaded stomachs showed quantities of deadly oxalates.

Gradually, neighboring stockmen began to notice that heretofore unexplained losses—2 cows here, 10 sheep there—seemed always to happen around halogeton. They also noticed that the weed was not just around that old bed ground at Hot Springs, it was in big patches all over the upper end of Raft River Valley. It was not just a lightning strike, but a prairie fire that menaced everyone.

A "halogeton association" was formed in southern Idaho in 1949 to get behind previously unsupported BLM requests for special reseeding funds, to control halogeton. First fruits of this effort came in the fall of 1950, with $75,000 of BLM funds allocated for reseeding of halogeton-infested areas in Idaho, Nevada, and Utah.



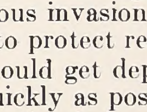
Nearly 11,500 acres were reseeded last October and November in the Raft River Valley alone from this and other funds. A research project has been started by the University of Idaho on BLM lands to check possibilities of chemical as well as cultural control.

Some of the facts already learned are:

Halogeton is here to stay, it is too well adap to the western range to be fully eradicat

Halogeton does not crowd out other plants, but fills in the spaces around them. Most grass ranges in good condition will have so few openings for the weed that halogeton will not get sufficient foothold to be dangerous.

Where grass seedings are not successful, as on the millions of acres of alkaline browse ranges, no way has been found for controlling halogeton by plant competition. Halogeton is at home on saline alkaline soils.



Halogeton varies widely in poison content, both during the year and from one year to another.

As with other dangerous things, an ounce o prevention is worth a pound of cure. Good range and livestock management appear to be the most important factors in halogeton control . . . both to prevent serious invasion of ranges now in good condition and to protect reclaimed ranges.

Stockmen should get depleted ranges into good condition as quickly as possible. They should be on the lookout for halogeton, and they should learn to recognize it. Halogeton resembles Russian thistle, but has a single hair at the tip of the leaf instead of the characteristic sharp point of the thistle.

And if halogeton is found, stockmen should sound the alarm . . . for halogeton—like a grass fire—may run them off the range. Halogeto everybody's fight.

RESOURCE MANAGEMENT SEMINAR . . .

SQUAW BUTTE: 1951

by **JOHN E. WIGGINS, Jr.**, *Forester*, Bureau of Land Management

This fall the third annual Resource Management Field Conference of the Bureau of Land Management will be held at the Squaw Butte-Harney Branch Range and Livestock Experiment Station near Burns, Oreg. Range managers, range conservationists, foresters, cadastral engineers, land economists, and administrative personnel from at least 11 Western States and the Nation's Capital will assemble to share information and exchange ideas on all phases of land management of the public domain.

Last September, 48 delegates from 5 regions and the Washington office of the Bureau met at Squaw Butte. BLM Director Marion Clawson headed the list of speakers. Professional and technical workers, representing the Bureau's varied activities, participated in the discussions and demonstrations.

Field trips constituted an important part of the training program of the conference. The group visited rangelands typical of the area; burned-over grassland that had been partially revegetated by natural regeneration; sites of sagebrush eradication experiments; reseeded areas; experimental plots established to illustrate improvement of grass species indigenous to the region when protected from excessive grazing; and areas that presented particular problems in land evaluation and land classification according to highest use.

The main sessions on forestry were devoted to actual demonstration, in an old-growth Ponderosa pine stand, of the elements of timber estimating and log scaling; the silvicultural practice of tree marking for selective cutting; and a thorough inspection of a logging operation under way and a large operating sawmill.

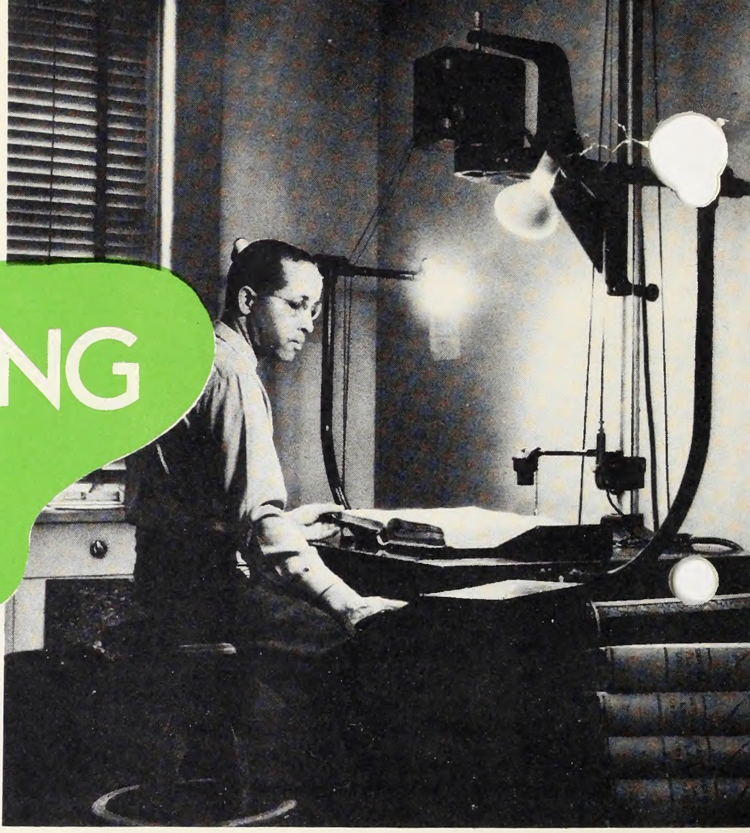
General discussions during the 17-day seminar were held on grass seeding and reseeding problems and techniques; relative forage productivity and range utilization of various native grass species and the exotic, crested wheatgrass; sagebrush eradication equipment; methods and equipment used in fire control; and area land-use classification.

Each year different employees are assigned as delegates with the ultimate objective of all technical and administrative personnel of the Bureau having the opportunity to attend these seminars within a 6-year period.

PARTICIPANTS. At the 1950 Squaw Butte seminar, a little over half of the paticipants lined up for a picture.

ONE YEAR OF MICROFILMING

by **WILLIAM C. HOLLAND,**
Acting Chief, Branch of Records Management



FILMING. The land records are photographed on 35-mm film in the same sequence as they are now arranged in the bulky bound volumes.

The land records and plats of the Bureau of Land Management constitute the basic structure of all real property transactions of the 29 public land States and Alaska, and are the only legal means of determining the location and evidence of title to more than 400 million acres of public domain lands in the States, and about 365 million acres in Alaska, managed by various Federal agencies, and more than 50 million acres of private lands in which the Government still owns an interest in coal, oil, gas, or other minerals.

The present public-land recording system had its beginnings in the first quarter of the nineteenth century, with the establishment of the General Land Office—one of the two predecessor agencies of the Bureau of Land Management. The maintenance of the record of surveys and of public land disposals was adequately met by the present record system for many years.

It was the inauguration and implementation of a new concept of public-land use that brought upon the present record system an almost impossible burden. This new policy was to be seen in the establishment of the national forests, national parks and monuments, fish and wildlife reserves, stock driveways, power-site reserves, mineral reserves and other reservations, and by the passage of the Mineral Leasing Act, the Taylor G g Act, and other similar measures.

The new conservation policy of Congress greatly increased the volume of necessary record-keeping and has required millions of additional entries in the reference or tract books, which were originally designed to accommodate references only to those lands patented by the United States. The result has been a gradual obsolescence of a reference system which is now totally inadequate to cope with present-day requirements.

These land records include the Patent Records, which are the land patents or deeds to all the public lands that have passed into private r other non-Federal ownership, or upon which e Government retains mineral, or other rights; the Survey Record, which contains the survey notes and township plats (maps) of all surveyed public domain lands; and the Tract Books, which are the only over-all reference to land disposal and acquisition, and the record of use of those lands—including all the acts and orders relating to them.

Microfilming of these public land records started in February 1950 as the most practical approach to the rehabilitation of a record-keeping system that dates back to 1825. A deed for every parcel of land granted to the citizens of the United

ECONOMY • EFFICIENCY • PERMANENC •

States since 1788 is recorded in one of 11,550 bulky volumes of "land patents" filed and used daily by the Bureau in the Department of the Interior Building in the Nation's Capital. Of these priceless 6,500,000 records, 1,130,000 were filmed at the end of the "microfilming" year.

Deteriorating from age, and showing wear from handling, some of these ancient record books were so badly in need of repair that expensive copying and rebinding was called for. Microfilming obviates the need for extensive rebinding and photographic or other reproduction of single pages. Microfilming these patent records also means a saving of a great many thousand dollars on operating and maintenance costs.

This is not the only saving accruing from microfilming, however. If the microfilming project is extended to include the 6,000 volumes of survey notes, 200,000 township plats, and 4,000 tract books, it will mean a saving of 4,000 to 5,000 square feet of office space in the Interior Building. These records now occupy over 8,000 square feet of space.

Added to these large savings will be a great many small ones. The employment situation will be eased somewhat, since it won't be necessary to fill some jobs that are vacated as employees move to defense agencies. The handling of heavy record books—now carted from place to place as they are needed—will no longer be necessary. Also, making reproductions of important records for use by other agencies and for the public is obviously much easier when the originals are already on film.

The savings on operating and maintenance costs alone will pay for microfilming the patent records, survey records, and tract books in about 5 years. After that, these savings will represent "earnings" for the taxpayer.

The steps necessary for the preservation of these vital land records also provide for the inclusion of new record-keeping techniques. Long-time economy, for example, dictates the need for a public-land recording system with adequate indexes. Such indexes must not only meet present-day requirements, but also those of the future—insofar as it is possible to determine the future requirements of a record system.

The use of modern equipment in offices has long been demonstrated in private business as the best means of rehabilitating a system.

While microfilming was first inaugurated in the Bureau as a solution to the great problems of rehabilitating the record system—as well as reducing cost and increasing efficiency in that system's operation—one of the important (and undoubtedly the most important) accomplishments will be the protection of these priceless records from destruction in war or by natural cataclysm, and their perpetuation for ages to come.

READING. The 100-foot rolls of film, each containing the records of three bound volumes, are filed in steel cabinets. The viewer can read each "page" on his machine as legibly as in the original book.

COPYING. Actual size copies of records are made directly from the film images. Facsimile prints on paper can be quickly made in answer to requests from governmental agencies and the general public.

active acres

HISTORY

The chart "Highlights in the History of the Public Domain," which appears on the back cover of this issue, shows the principal events in the acquisition and disposition of the public domain. It has been used constantly since 1949 by many teachers of American history in both high schools and colleges.

The history of these public lands is of such importance to those who would understand the greatness of our Nation that any teaching help is warmly welcomed. Thousands of requests have come to the Bureau of Land Management for the highlights chart—requests from Harvard, Stanford, and the University of Wisconsin, from high-school teachers throughout the Nation, and from economists and research foundations.

Charts are available in 32- by 44-inch and 8- by 10½-inch sizes. A folder explaining the "highlights" in greater detail, and two booklets, "Brief Notes on the Public Domain," and "Graphic Notes on the Public Domain," are also available.

PEOPLE

As a contribution to the range management portion of the Foresters Field Manual (published by the Society of American Foresters), Mr. Milo H. Deming of region IV collected and submitted material on breeds of livestock, poisonous plants of western United States, and tables for selection and design of such range improvement facilities as fences, wells, dams, and reservoirs. The publication is a ready-reference manual for field workers in several phases of conservation work.

DEVELOPMENT

The BLM soil and moisture conservation program in the Buck Horn Flats area, a part of which is in the San Rafael Basin, includes fencing, pasture rotation, and water spreading. Various phases of range management are considered the most important items in the program. Range management includes supervision of up to 15,000 cattle and up to 50,000 sheep, which use the area for part of each year. There appears to be a chance in the Buck Horn Wash area to measure the change in the amounts of sediment and runoff which may occur as a result of BLM work.

AT RANDOM

In the States the Bureau of Land Management administers more than 180 million acres of pub lands, chiefly in the West . . . principally ran lands but including more than 30 million acres of forest and woodland. In Alaska, the Bureau manages more than 290 million acres, including 125 million acres of timberlands. In addition BLM is responsible for oil, gas, and mineral leasing on a total of 750 million acres of public lands, and for cadastral surveying and land-record keeping on all of the original public domain, exceeding a billion acres.

Unusual flying hazards were created in Alaska last year by smoke-haze from forest, brush, and grass fires on 2,225,000 acres of public domain. BLM, which is responsible for fire prevention and control in most of Alaska, was hard-pressed to cope with the situation on its fire-prevention-and-control budget of 1 mill an acre. Volunteer help—including men and equipment from the military services—enabled the Bureau to prevent greater damage. Adverse weather conditions predisposed the forests and brushlands to fire outbreaks.

Contacts have been made with the Nevada Experiment Station and the Nevada Department of Agriculture in an effort to work out cooperative plans for a small start on halogeton control this spring.

BOOK SHELF

WESTERN STOCK RANCHING, by Mont H. Saunderson, University of Minnesota Press, Minneapolis, Minn., 1950. Mr. Saunderson, Range Economist, United States Forest Service, formerly Ranch Economist, Montana State College, presents "materials concerning western stock ranch economy and management." The 240-page book includes a chapter on The Use of Federal Public Lands.

LAND PROBLEMS AND POLICIES, edited by John F. Timmons and William G. Murray, Iowa State College Press, Ames, Iowa, 1950. This book contains the lectures, in revised form, prepared and given by "outstanding students of land problems and policies" at the Land Problems and Policies Seminar held in connection with the Land Economics Institute at Iowa State College in 1949. One of the chapters, Use and Control of Water Resources, is by BLM Director Marion Clawson.

UNCLE SAM'S ACRES, by Marion Clawson, Dodd, Mead & Co., Inc., New York, N. Y., 1951. Written for the layman, this book gives a graphic and entertaining account of how we acquired our public lands and the ways they are managed for the benefit of the people.

FOR THE RECORD

Nearly $13,000,000 was paid to 25 States and the Territory of Alaska as their share of Bureau of Land Management receipts collected during fiscal year 1950 from the administration of public lands.

Payments to the States is made semiannually or annually as provided by law in lieu of taxes which might be levied by the States if the Government-owned lands now under BLM's jurisdiction were transferred to private ownership.

The Bureau collected revenues amounting to over $36,000,000 during fiscal year 1950. After $12,750,140 had been set aside for distribution to States, the remainder went to the United States Treasury. Operations of the Bureau of Land Management from congressional appropriations amounted to $7,483,357 in 1950.

While drainage problems affect other parts of the Nation, BLM practices water conservation in the West. Water spreading, gully control, and maintenance of cover growth on the watershed are the means used. In support of this work, private land owners have contributed 30 percent (in money, equipment, and work) of all funds and efforts allotted for soil and moisture conservation *public* lands.

Two Kodachrome-slide lectures used by BLM officials to illustrate conservation work on public lands in Wyoming are "Taming an Outlaw Gully" and "Wild Water Wealth." The latter explains how flash floods can be "spread" on rangelands to increase forage production.

FOREIGN PROGRAMS

Dr. Marion Clawson, Director of the Bureau of Land Management, spent several weeks last fall in Lahore, Pakistan, where he participated in a training center on economic appraisal of Asian development projects. The training center was a technical assistance project under the sponsorship of the government of Pakistan, the Food and Agriculture Organization, the International Bank for Reconstruction and Development, and the United Nations. The Economic Commission for Asia and the Far East actively cooperated in the organization of the center.

The object of the center was to help professional workers in Asian countries by training in preparation of development projects and the appraisal of their economic feasibility, so that such projects will be in more suitable form for consideration by national development bodies and by international financing institutions. As one of the principal lecturers, Dr. Clawson conducted a course on land problems and resource development.

Approximately 50 representatives attended from such countries as Australia, Burma, India, Indonesia, Nepal, Pakistan, Thailand, and some non-selfgoverning territories of southeastern Asia.

BLM's Chief of Cadastral Engineering Earl G. Harrington, represented the United States at the Conference of British Commonwealth and United States Survey Authorities held at Wellington, New Zealand, last November. The conference was held principally for the purpose of discussing the functions and qualifications of land surveyors, with the possibility of developing a system of reciprocity for surveyors between the participating nations.

Byron C. Denny, Chief of the Bureau's Branch of Land Classification, attended as a member of the United States delegation the Fourth Inter-American Conference on Agriculture at Montevideo, Uruguay, last December. While in South America, he conferred with officials in Colombia, Argentina, Bolivia, Peru, and other Latin American countries on public-land management problems in connection with program planning for the Point Four technical assistance program.

LAND OFFICE BOOM IN OIL-SHALE PATENTS

(Continued from page 5)

demonstrated that the distillation of oil is not only practicable but an economic possibility. The most important products of kerogen refining at present are heavy fuel and heating oils, but gasoline and many other byproducts can also be attained.

While the first real interest in oil shale was probably developed in Scotland in 1850, it was in 1916 that far-seeing mining men and industrialists of the United States began to explore the possibilities of our Western oil-shale resources. In a 4-year period from 1916 to 1920 many thousand oil-shale placer claims were located, primarily in western Colorado on public domain lands. To a lesser degree this same activity took place in Utah and Wyoming.

On February 25, 1920, the mineral leasing law was approved, and oil shale was included as one of the leasable minerals. This effectively stopped the further location of any placer mining claims for oil shale on public domain lands.

With the approval of the Mineral Leasing Act and the 1930 withdrawal of all oil-shale lands by Executive order—which was predicated on the study made by the Geological Survey of the vast oil-shale lands—all shale lands, subject to valid existing rights, were temporarily withdrawn from lease or other disposal, and reserved for the purposes of investigation, examination, and classification.

From 1920 until 1930 little or no development work was done for the benefit of the oil-shale placer mining locations and the Department of the Interior took the stand that where no development was made the claims were invalid. This was set aside, however, by the Supreme Court, and the claimants of the land relaxed in their knowledge that their claims were secure—and they undertook little development work until World War II.

In the past 5 years the oil-shale industry has been "booming." The sale value per acre has risen and a vigorous mining technique—albeit still in the infant state—has developed. In the past 2 years it is estimated that more than 40,000 acres of land in Colorado have proceeded to patent and are now on the tax rolls of the counties.

The Bureau of Land Management, recognizing the need to assist and facilitate the growing oil-shale industry, has cooperated in every respect with the mineral patent applicants. Where patent proceedings at one time took a period of years, the same is now being accomplished within a few months. The Bureau of Land Management, through its experienced field engineering force, is also assisting the patent applicant in advising how to do future development work leading to patent.

Technological advances, research and development have reduced the cost of extracting and refining shale oil to the point where it may compete with oil from underground reservoirs, but a great capital investment will be needed in mining, refining, and transportation equipment before shale oil can be widely used.

Increasing demand for more oil, plus the difficulty and cost of finding new oil reserves, may soon cause the Nation to look to Colorado's mountain of oil for greater production. Mea while, Interior's three agencies—Bureau of Mines, Geological Survey, and Bureau of Land Management—work together to make one of the greatest resources of the public domain available for the use of the Nation.

Efficiency Corner

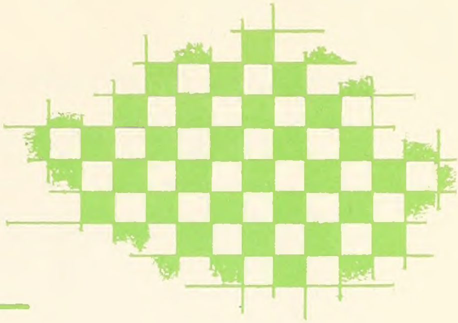
HELICOPTERS USED TO RESEED FORESTS

Cooperative experiments of the Bureau of Land Management have proved that the low-flying helicopter is a faster, cheaper, and more effective method of reseeding forest lands than the "hand-plant" system. In comparing costs, the helicopter seeding can be done for approximately $4 per acre for seed, rodent control, and flying time while hand-planting seedling trees raised in private and public nurseries would cost $20 to $25 per acre.

Seeding by air is fast, for a helicopter can cover 2,000 acres in a single day—where a good man does well to plant an acre a day by hand. In addition, five times as much land can be aerially seeded for the same money as can be covered on the ground.

Although large acreages exist that must be hand-planted because they do not lend themselves to the aerial method, experience gained from extensive tests indicates that on a major percentage of the denuded lands of the Douglas fir region, aerial methods can be expected to produce successful reforestation.

Two helicopters were used last year by BLM and the Oregon Department of Forestry to reseed 2,000 acres of fire-burn in Polk County, Oregon. The area that was seeded represents one-tenth of the area burned in the Black Rock blaze of 1945. Other portions of these lands have already been hand-planted from nursery stock or reseeded naturally from parent seed-trees that escaped the forest fire.



UNITED STATES CHECKERBOARD

by **WILLIAM R. BANDY**, *Regional Chief,* Cadastral Engineering, Region III

The United States "checkerboard"—that land divided into townships and sections by early cadastral surveys of the public domain—represents one of the most efficiently plotted areas in the world. Nevertheless, covering a portion of a spherical planet with perfect squares results in certain disturbing peculiarities. One of these is the "why" of the perplexing jogs from east to west which one encounters every 24 miles in the land pattern of fields and roads along section lines—such as those along the Nebraska-Kansas State line.

To understand this peculiarity, one must realize that in running lines due north, Federal surveyors had to make some provision allowing for convergency of meridians. If two surveyors start run lines north from a point 6 miles apart, they ll get closer together as they go northward, and ey will meet at the North Pole. The convergency in two lines only 24 miles long, however, amounts to only a few hundred feet.

The ordinance of the Continental Congress in 1785, which provided for the present rectangular system of surveying, made only a brief provision for 6-mile squares called townships. No thought was given by the Congress to scientific methods of procedure. It was left to the surveyors to devise the method and the instruments needed. The result, happily, was the best surveying method ever devised for vast areas.

There was considerable difference of opinion among those early law-makers as to the proper size to make townships. Some advocated making them 10 miles square, after the decimal system. Others thought that would be too large and urged the 6-mile square used by the Colony of Massachusetts. In 1634 that Colony made small grants of lands to groups for "towns." The squares were 6 miles square, and seemed to be the most efficient size.

The first large area to be surveyed under this new system was in what is now the State of Ohio. Many details remained to be worked out by these early surveyors making their first attempt to put the new system into active practice in the vast wilderness. It was at this time that provision s made for numbering the 36 "square-miles" designating them as "sections." Provision was also made for dividing the sections into aliquot parts.

The magnetic needle was employed in the early days to determine the direction in which to run the section lines. However, as the science of surveying advanced, and the demand for more accurate land surveys increased, solar attachments were devised for use on compasses and transits which enabled the surveyor to determine true north at any point during the day by observing the sun. These instruments provided by mechanical means for solving graphically and quickly the celestial triangle. This invention—the solar transit—was a great boon to Government surveyors. By its use, errors due to local attraction of the magnetic needle were eliminated, and clearing of the lines for back and foresights was no longer necessary.

Simplicity in identification of individual tracts, and the use of scientific principles which satisfy legal requirements, make this checkerboard system one of the most efficient and practical systems of land identification ever devised by any nation. It has prevented the vast confusion and litigation over land titles which inevitably result when indiscriminate location is permitted. It has enabled us to maintain good land-title records because of the ease and accurate means of land description.

Under the rectangular system, every aliquot part of a section—whether it contains 1¼, 2½, 5, 10, 40, or 160 acres—has a definite description . . . a description which is not duplicated. If a tract is described with reference to the proper section, township, range, principal meridian, and State, there is no other parcel of land in the entire area of the original public domain, consisting of over 1,800,000,000 acres, which can be confused with it.

The final survey record consists of field notes describing in detail the processes of survey, the results on the ground, and the plat . . . which is a graphic presentation of the surveys made in the field. The plat shows the courses and lengths of survey lines, and incidental items of relief, drainage, and man-made structures or "culture." Its basic function is to designate and describe areas in specific terms and to serve as the legal basis for all transactions involving the public lands.

CONSERVATION OF THE PUBLIC RANGE

(Continued from page 4)

out annual weeds almost completely. The rehabilitated range furnishes 5 times as much feed per acre as adjacent stands of fair sagebrush, and 10 times as much feed as rabbitbrush and sage where the native grasses have been killed. The soil cover is vastly improved.

At the Bureau's Squaw Butte-Harney Range and Livestock Experiment Station, operated in cooperation with Oregon State College, gains in forage capacity from reseeding average over 300 percent. A total of 48,000 acres of successful crested wheatgrass seedings have been made by the Bureau in Idaho and Oregon. An additional 25,000 acres is being seeded in the present year.

The accompanying pictures show results of range rehabilitation conducted as part of the Bureau's soil and moisture conservation program on Federal range near Burley, Idaho.

CONSERVATION NEEDS

Prerequisite to rehabilitation is protection from trespass, over-use, fire, and other forms of damage. This is a primary objective of the Bureau's program. In carrying out this objective, the Bureau has found it necessary to reduce the rate of use in depleted range areas. Use which is moderate in terms of current growth not only conserves the grass for watershed protection and future years' forage, but also results in higher gains per head from the current year's grazing. Moderate grazing turns out better quality livestock at lower costs of production, with higher net returns per acre and per ranch than under heavy use.

The immediate protection problem is that the degree of protection that can be given under the current level of operations is seriously inadequate. Provision should be made for substantially greater protection in keeping with increased resource needs and values.

Adequate range surveys, classification surveys, topographic surveys, and other types of basic data are a prerequisite to conservation of any natural resource.

The Bureau has made impressive accomplishments in soil and moisture conservation on the public lands under the National Soil Conservation Act, but—considering the need—progress has been slow, as a result of inadequate funds.

BENEFITS AND COSTS

Activities necessary for the management of the public range produce benefits to the users of the lands, to local industries or communities, and to the general public. Potential public benefits are highly significant. Resource productivity is built up and employment is increased. Benefits are created for wildlife, recreation, reduction of flood and silt damage, and water-supply production.

Much of the public range can be returned to something near its potential productivity at reasonable cost. On the average, $5 per acre w cover the costs of reseeding and related improvements on adapted lands in the Pacific Northwest—with variation between $2 and $10 per acre. Nearly 3½ million acres administered by the Bureau in Idaho and Oregon require reseeding and an additional 12½ million acres require revegetation by natural means.

As an average, range reseeding and related work—costing $5 per acre—would increase grazing capacity from 20 acres per animal-unit month to 4 acres. Expressed differently, the work would increase livestock gains during the range season from 2 pounds per acre to 10 pounds on the rehabilitated land. Reseeding an acre, with total costs on an annual basis of 60 cents would enable the production of eight additional pounds per year, valued at upwards of $1.60. With this incentive, many ranchers are reseeding private lands.

A BALANCED PROGRAM

Equitable allocation of administrative and improvement costs on the public range is a difficult problem—one that must be solved before rehabilitation of public lands will receive full support from either the Government or the stockmen. In the meantime, it is obvious that conservation and rehabilitation of the public range is falling far behind other conservation programs sponsored the Government.

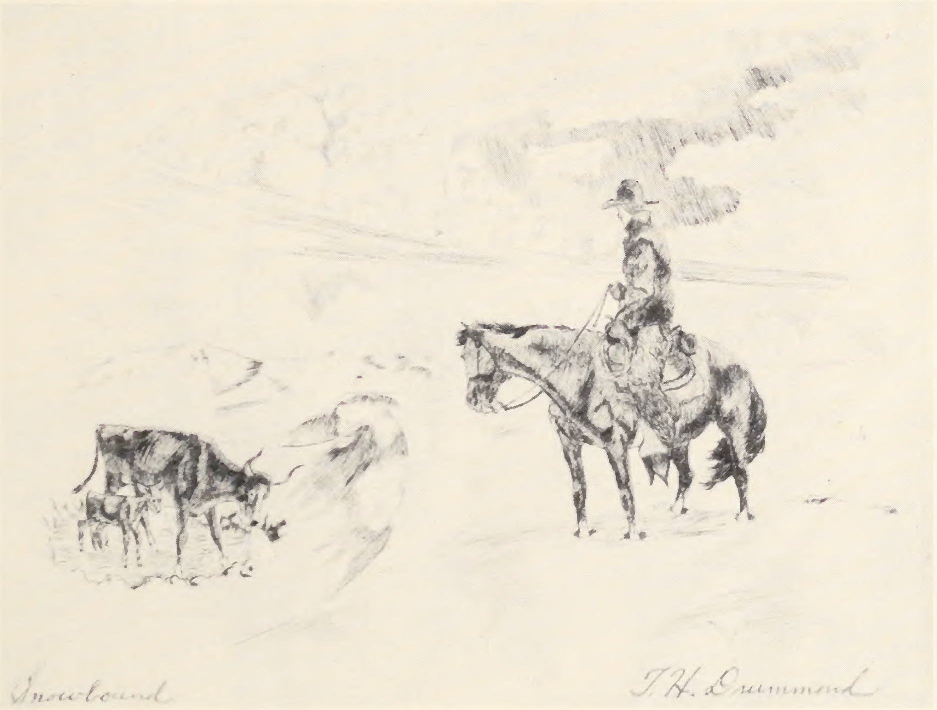
For example, the Agricultural Conservation Program administered by the Production and Marketing Administration provides extensive financial assistance for conservation practices on private rangelands. Including deferred grazing and reseeding, the program provides a subsidy up to 80 percent of the cost. In 1947, 575,000 acres of private rangelands were reseeded at an average cost of $3.11 per acre to the Government.

By contrast, no appropriation has ever been made for a general reseeding program on the Federal public lands. Small amounts only have been available for research, demonstration, and reseeding local areas as required in soil and moisture conservation projects.

It is true that the public range is low in productivity now, but its potential justifies investment in its future value. Accelerated soil erosion and "accumulated danger" of neglect to watershed, wildlife, and other public values are also at stake. If the Government can afford to subsidize the conservation of private rangelands, it can ill afford not to provide for equivalent conservation of the public range.

In the Pacific Northwest, as elsewhere in the West, extensive conservation and rehabilitation of the Federal range is feasible from an operational standpoint. Further research is needed, but the primary need is to carry out known techniques a larger scale upon the range itself.

Draftsman's Art Exhibit



SNOWBOUND **T. H. Drummond**

T. H. Drummond, BLM Cartographic Draftsman, Division of Engineering, region II, gives an artist's concept of grazing activities and wildlife management in the first public exhibit of his art work, now on display in the Interior Department Museum.

The exhibit, which opened March 12 and closes April 6, has as its focal point a pictorial map of California, showing with numerous sketches the variety of activities undertaken by the Department of the Interior in that State. Arranged around the map are 12 drawings and etchings showing scenes typical of western rangeland management by BLM.

A carving in California redwood of Interior's buffalo emblem is given a prominent position. Carvings of a mare and colt are also featured as well as two of Mr. Drummond's oil paintings, Half Dome and Deer and Redwoods.

Mr. Drummond's talent is receiving favorable recognition among many well-known persons in Washington art circles who have viewed the exhibit. In his appraisal of Mr. Drummond's work, Museum Curator Harry L. Raul, joined other Eastern viewers in praising the excellent feeling of life and line displayed by the artist. "Mr. Drummond's work is alive with action and is technically of a high order," said Mr. Raul, a well-known Washington artist himself.

The etching shown above, Snowbound, by Ted Drummond, tells an important story. Typical of range managers' activities of watching over stock—even during storm and blizzard—the scene is a reminder of Operation Snowbound in the winter of 1948–49. During and following the great storm of that season, BLM employees . . . and equipment . . . participated in the drive to open trails to snowbound stock to bring in supplementary feed.

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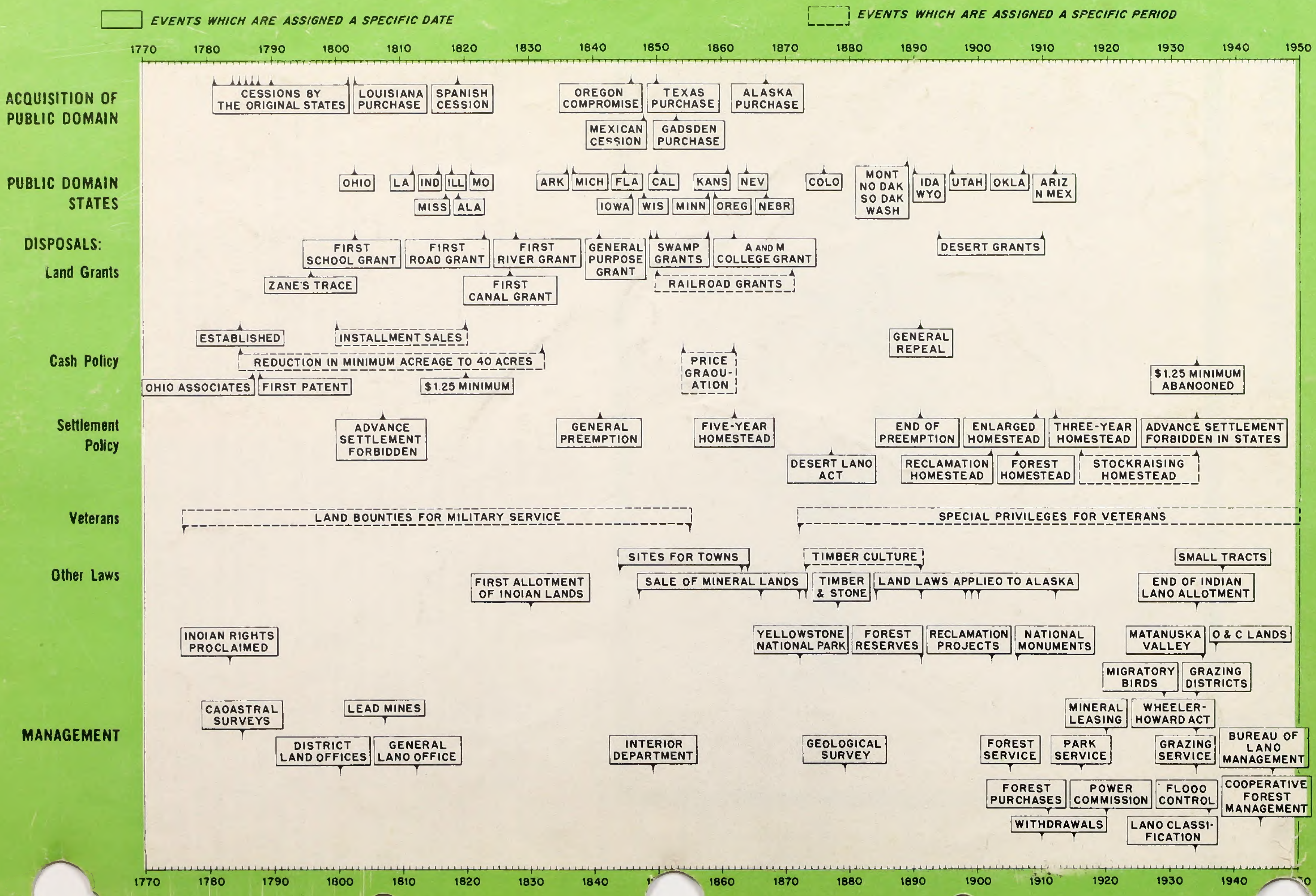
BUREAU OF LAND MANAGEMENT

HIGHLIGHTS IN THE HISTORY OF THE PUBLIC DOMAIN



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See comments under "History